REMARKS

The subject invention relates to an improvement for a beam profile ellipsometric system. This proprietary technology was developed by the assignee herein and was originally disclosed in U.S. Patent Nos. 5,042,951 and 5,181,080 and various subsequent patents. In these systems, a high numerical aperture lens is used to focus the beam onto the sample to create a spread of angles of incidence. A detector is provided which can generate output signals which include the angle of incidence information. More specifically, the detector can include a 2D array (see Figure 3 of the subject application) which can generate outputs corresponding to individual angles of incidence. In an alternate embodiment, the detector can be a quad cell with each quadrant generating an independent output corresponding to an integration of all the angles of incidence. In both detector configurations, the independent outputs are derived along two orthogonal axes.

The subject invention is directed to an approach for determining the polarizing effects induced by the objective lens which focuses the light on the sample. If these artifacts can be determined, the analysis of the sample can be improved. In accordance with the subject invention, additional information is derived by rotating one of the compensator or the analyzer to obtain a second measurement. Using this second measurement, the processor can treat the lens as an equivalent waveplate at a particular azimuthal angle and retardation value. The effects of this equivalent waveplate can be removed from the analysis of the sample to obtain more accurate results.

In the Office Action, the Examiner rejected claim 4 as being anticipated by Rotter (6,784,991). The Examiner rejected claim 1 as being obvious based on Rotter and Wagner (6,256,097). Finally, the Examiner rejected claim 2 as being obvious based on Rotter, Wagner and Aspnes (6,320,657). It should be noted that both the Rotter and Aspnes patents are assigned to the same assignee as the subject invention.

The Examiner also objected to claim 3 and indicated that it would be allowable if rewritten in independent form. In response, applicants have amended claim 1 to include the subject matter of claims 2 and 3. It is believed claim 1 is now in allowable format. Upon review, it was noted that some of the specific language of original claim 2 did not appear in the specification. Applicants have amended the specification to include the language of claim 2. No new matter has been added since this language appeared in the application as filed.

For the reasons discussed below, it is submitted that original independent claim 4 is patentable over the cited art. The patent to Rotter discloses a measurement system with multiple optical measurement paths and technologies. One of the technologies corresponds to a beam profile ellipsometry system. In this technology path, light from laser 720 is focused onto the sample by lens 732. Light collected from the lens is directed by beam splitter 746 into a collection arm that include a waveplate 734, polarizer (analyzer) 736 and quad detector 740. Rotter however, does not teach rotating the compensator (waveplate 734), nor does it teach rotating the compensator into "two different azimuthal positions in order to determine the changes in the phase in the probe beam induced by the focusing optical element." In fact, there is no discussion in Rotter of evaluating the polarization effects of the lens 723. Thus, Rotter cannot anticipate claim 4.

In the Office Action, the Examiner mentioned that Rotter teaches rotating compensator 776. Compensator 776, however, is part of a completely different detection technology. More specifically, compensator 776 is part of a broadband, off-axis ellipsometer of the type disclosed in the cited Aspnes patent. In this system, light from the broadband source 722 is focused by a mirror 772 onto the sample at a non-normal angle of incidence. The reflected light is collected by a second mirror 774. The light is directed through the compensator, polarizer 780 and into a spectrometer 758. This measurement technology is quite unlike the claimed beam profile ellipsometer system. For example, there is no lens for focusing **and** collecting the beam. There is no quadrant or two-axis detector. Finally, Rotter has no teaching regarding evaluating the polarizing effects of the beam focusing optics.

The patent to Wagner is concerned with evaluating the polarizing effects induced by system optics on the measurement. Wagner approaches this problem by inserting a convex reflector into the beam causing the beam to return to the detector without reaching the sample. This approach is completely different from the subject invention wherein the beam is focused on the sample and information taken from two orthogonal axes of the detector is used to account for the polarization effects induced by the objective.

Applicants have added new claims 5 to 16 which are also believed to be patentable over the art of record.

In the Office Action, the Examiner noted that the IDS submitted on February 19, 2004, was entered and the references considered. However, the Office Action did not include a copy of

the initialed PTO 1449 nor could one be found on the Pair database. The Examiner is requested to send a copy of the initialed PTO 1449 to the applicants for their files.

Respectfully submitted,

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Dated: September 23, 2005

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